AF/2683

20476-904739

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Before the Board of Patent Appeals and Interferences

IN RE APPLICATION OF	:	John E. Hudson
SERIAL NO	:	~~09/668,557~~ 09/688,557
FILED	:	October 16, 2000
FOR	:	Wireless Communication System and Method Therefor
EXAMINER	:	James D. Ewart
GROUP ART UNIT	:	2683
CUSTOMER NUMBER	:	23644

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450," on July 12, 2004.
Name of person signing Jennifer J. Ramirez
Signature _____

BRIEF ON APPEAL

Honorable Director of Patents and Trademarks
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This appeal is from the examiner's final office action of February 11, 2004. A proper Notice of Appeal was timely filed on May 11, 2004 and this brief is therefore due to be filed by July 11, 2004.

This brief is being filed in triplicate, along with the fee of $330 pursuant to 37 C.F.R. §1.17(c).

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(1) **Real Party in Interest**

This application is assigned to Nortel Networks Limited. The assignment is recorded at 011464/0460.

(2) **Related Appeals and Interferences**

There are no related appeals or interferences.

(3) **Status of Claims**

This application was filed with claims 1 through 48. The claims have not been amended during the examination procedure and consequently the claims as currently pending are as filed. The claims as currently pending and appealed are set forth in Appendix A.

(4) **Status of Amendments**

A paper entitled "Response to Office Action Mailed February 11th, 2004" was filed April 07th 2004 and entered by the Examiner. No amendment of the specification or claims was made.

An Advisory Action maintaining the Examiner's rejection of claims 1 to 48 as filed was mailed April 20, 2004. It is this rejection of the claims that is being appealed.

(5) Summary of the Invention

The present invention is directed to enhancing the wireless link bandwidth in a cellular wireless communications system in which data traffic is communicated between a remote terminal (132), such as a web content server, for example, in an external network, via a wireless communications system mobile switching centre (MSC) (128) and a plurality of base stations to a wireless communications system terminal (200). This is achieved by establishing a plurality of simultaneous but separate respective communications links between the terminal (200) and the plurality of base stations. It is implicit therefore that said terminal is located within the respective geographical coverage areas (cells) of said plurality of base stations and that the arrangement of the present invention is limited to one in which the geographical coverage areas of such base stations are arranged to overlap sufficiently to enable said wireless terminal to be located within a plurality of base stations' cells. Additionally, each of the plurality of simultaneous communications links carries some of the data traffic being communicated from the MSC via the plurality of base stations to the terminal, where the data traffic content of each such link comprises a different (i.e. non-identical) part of said data traffic.

The present invention thereby enables the bandwidth to the wireless terminal (200) to be considerably increased above that which could be provided on a communications link between the wireless terminal and a single base station.

(6) Issues

The following issues are presented:

1. The rejection of claims 1, 2, 3, 5 to 14, 17, 19 to 25, 27 to 33, 35 to 41 & 43 to 48 under 35 U.S.C. 103(a) as being un-patentable over Kanerva et al (US 5793744) in view of Bi et al (US 2002/0036999);

2. The rejection of claims 4, 18, 26, 34 & 42 under 35 U.S.C. 103(a) as being un-patentable over Kanerva et al and Bi et al and further in view of Smith et al (US 6009124).

3. The rejection of claim 15 under 35 U.S.C. 103(a) as being un-patentable over Kanerva et al in view of Willars et al (US 6449290); and

4. The rejection of claim 16 under 35 U.S.C. §103(a) as being unpatentable under Kanerva et al and Willars et al further in view of Smith et al.

(7) **Grouping of Claims**

Claims 1 to 48 can be considered as a group.

(8) **Argument**

Referring to issues 1 & 2, Kanerva teaches a mobile cellular wireless communications system in which a mobile terminal establishes a single (one to one) communications link with a base station in whose cell it is located. The single communications link comprises a multiplicity of parallel channels, e.g. time-slots or carriers, as a means of increasing the link bandwidth between the terminal and the single base station. Thus, Kanerva is directed to a scheme of how to divide the single communications link between the mobile terminal and the base station into a

multiplicity of channels in order to increase the portion of bandwidth available on the single communications link to the terminal. As confirmed in Kanerva, the multiplicity of parallel channels (multichannel data link) is substantially similar to a single channel link (see Kanerva, column 8, lines 25 to 27). The link bandwidth cannot therefore be increased above that sustainable by the single communications link between the mobile terminal and the single base station. There is no suggestion in Kanerva of establishing further communication links simultaneously between the mobile terminal and a plurality of other base stations in order to further enhance the wireless link bandwidth. There is also no suggestion of arranging the coverage areas (cells) of base stations to be overlapped so that a mobile terminal may be within the cells of a plurality of base stations at any one time which would be necessary to arrive at an arrangement consistent with that of the present invention.

A skilled addressee will be fully cognizant of the fact that the mobile cellular wireless communications system as taught by Kanerva is of a conventional structure in as far as the geographical coverage areas of the base stations are arranged such that they mesh together to provide continuous wireless coverage but generally do not overlap, although in practice some overlap at the margins of adjacent cells does occur. It is in this context that the teaching of Bi of a mobile terminal communicating with two or more base stations in a soft handoff arrangement is relevant.

Bi, like Kanerva, is generally representative of a conventional mobile cellular wireless communications system in which the geographical coverage areas of the base stations are arranged such that they mesh together to provide continuous wireless coverage but generally do not overlap. In such a system, a mobile terminal establishes a single call connection (communications link) with a base station in whose cell it is located, but that, as the mobile terminal moves to a point where it is exiting the coverage area of the cell, a handoff process must occur with the base station of an adjacent cell to ensure that the call connection is continued and not lost.

Soft handoff is a technique common to mobile cellular wireless communications systems enabling a mobile terminal to communicate with two or more base stations at the same time during the handoff process, but not for other purposes. Soft handoff eliminates the potential ping-ponging of handoff that can occur where there are regions of overlap at the edges of adjacent cells (cf Bi, paragraph 0003, lines 1-4 and paragraph 0004, lines 4-7).

However, when a high number of base stations are involved in a soft handoff this presents a high overhead on the transmit power needs and degrades the actual capacity of the wireless system (cf Bi, paragraph 0005, lines 10-13). Thus, Bi reveals that allowing a mobile terminal in a mobile cellular wireless communication system to communicate with a number of base stations (only during hand-off) degrades the wireless system capacity (available bandwidth). It is for this reason that Bi proposes the use of simulcasting elements (repeaters) at the margins of cells where the signal strengths of adjacent base stations are within a close range of each other in order to improve the handoff process, but not to provide additional communications links with other base stations carrying different parts of a data traffic for a wireless system terminal.

It follows from the above that Bi teaches against the present invention in that it teaches that it is undesirable to allow a wireless communications terminal to communicate simultaneously with a plurality of base stations even in a handoff process. Also Bi, like Kanerva, does not teach the feature implicit in the present invention that the cells of base stations are arranged to overlap to a degree sufficient to enable a terminal to form a plurality of separate respective communications links with a plurality of such base stations for a data transfer session.

Additionally, it is a commonly held view in the field of wireless communications systems that multiple communication paths to terminals increases interference between terminals and base stations and thus reduces overall system

capacity (bandwidth) since wireless systems respond imperfectly to interference. Consequently, a skilled person would dismiss a proposal to establish multiple communications links between a terminal and a multiplicity of base stations as impracticable in the knowledge that such an arrangement would decrease system capacity through increased levels of interference rather than produce an increased aggregate bandwidth. However, the present invention originated from a detailed statistical analysis that demonstrated than it is possible to implement such a scheme and achieve an enhanced bandwidth for a terminal without degenerating overall system capacity.

Since Bi is representative of the feature of the art that it is known for a terminal to communicate with a plurality of base stations in a soft handoff process which causes degradation of system capacity, it is clear that the present invention as defined by claim 1 at least goes against the teaching of the art and cannot be considered to be obvious in light of Kanerva and Bi (or the art as generally known).

The Examiner has contended that his rejection of claim 1 is such that he is not combining the entire invention of Bi with that Kanerva, but that Bi is simply showing the teaching of communicating with a plurality of base stations. This position is, however, inconsistent with what the Examiner previously purported would motivate a skilled person to look to Bi for the "missing" feature not taught in Kanerva of "communicating with a plurality of base stations". The Examiner has previously indicated that this motivation stems from a desire to provide a "smooth transition at handoff". In view of this, it is entirely pertinent for the applicant to consider the disclosure of Bi as it relates to the "missing" feature to determine how the teaching of Bi would lead a skilled person to adapt the system as disclosed in Kanerva and whether such combination would arrive at the present invention as claimed.

It can be concluded therefore that neither of Kanerva nor Bi teaches the provision of a plurality of separate respective communications links between a

wireless terminal and a plurality of base stations for the purpose of communicating data to the terminal nor the feature implicit from this that the cells of the base stations must overlap sufficiently to allow a terminal to reside within the overlapping cells of said plurality of base stations. In fact, both Kanerva and Bi are consistent with each other in contrast with the present invention in that they each teach an arrangement of non-overlapping cells which only afford communication between a terminal and a number of base stations for the purpose of a soft handoff process and no other reason. Thus, the combination of Kanerva and Bi does not teach or suggest all of the claims limitations.

In view of the above, there is nothing in the teaching of Bi relating to providing a smooth transition at handoff that would motivate a skilled person to modify Kanerva to replace the parallel set of channels on a single communications link between the wireless terminal and the single base station by separate respective communications links between the terminal and a plurality of bases stations (having overlapping cells). The teaching or suggestion to make the claimed combination and the expectation of success must both be found in the prior art references and not in the applicant's disclosure. It is clear that the Examiner is making use of hindsight to declare the present invention as defined by claim 1 obvious in the light of Kanerva and Bi which address very different technical issues. The rejection of claim 1 cannot therefore be sustained.

Since claims 2, 3 & 5 to 14 are dependent from claim 1, the rejection of these claims is moot in view of the foregoing. The same is true for claim 4.

The rejection of independent claims 17, 25, 33 & 41 on the same grounds as the rejection of claim 1 cannot be sustained for the reasons as set out above. Further, the rejection of dependent claims 18 to 24, 26 to 32, 34 to 40 & 42 to 48 is moot in view of the foregoing.

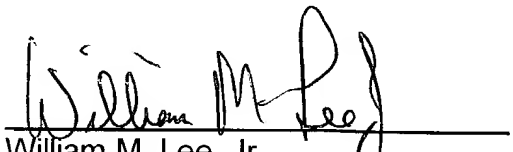
Referring now issue 3, it should be noted that Willars teaches the provision of a plurality of modems in a base station, not a terminal as in the present invention. In additional, Willars is not directed to the issue of enhancing the wireless bandwidth to a terminal through a plurality of simultaneous communications links between the terminal and a plurality of base stations. Instead, that part of the disclosure of Willars relied on by the Examiner addresses a soft handoff technique in which a new base station modem is assigned to a terminal while the old base station modem continues to serve the call (col 2, lines 9 to 14). Once good communications are established with the terminal the old base station modem discontinues serving the call (col 2, lines 19 to 23). Once again, given that Kanerva and Willars address very different technical issues, a skilled person would not be motivated by the teaching of the existence of a plurality of modems in the base stations of Willars to modify the terminals in Kanerva to include multiple modems.

Consequently, the rejection of claim 15 cannot be sustained. The rejection of dependent claim 16 is moot in view of the foregoing.

The applicant therefore urges reversal of the Examiner's various rejections of claims 1 to 48 which are believed to define an invention which is both novel and non-obvious having regard to the prior art references relied on by the Examiner, taken alone or in any combination.

July 12, 2004

Respectfully submitted,



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APPENDIX A

1. A wireless communications system comprising a terminal capable of communicating with a plurality of base stations using a respective plurality of simultaneous communications links, a number of the plurality of simultaneous communications links bearing content data, wherein the content data borne by each of the number of the plurality of simultaneous communications links are non-identical.

2. A system as claimed in Claim 1, wherein at least one of the plurality of base stations supports a plurality of sectors.

3. A system as claimed in Claim 2, wherein the at least one of the plurality of base stations comprises a sectored antenna.

4. A system as claimed in Claim 1, wherein the terminal comprises an antenna arrangement arranged to direct a sector or beam to one of the plurality of base stations for providing a near-isolated communications link to the one of the plurality of base stations.

5. A system as claimed in Claim 1, wherein at least two of the communications links are completely isolated from each other.

6. A system as claimed in Claim 1, further comprising a routing entity capable of dividing the content data between the number of the plurality of communications links so that a proportion of the content data is communicated over a communications link of the number of the plurality of communications links and another proportion of the data is simultaneously communicated over another communications link of the number of the plurality of communications links.

7. A system as claimed in Claim 6, wherein a source of the content data comprises the routing entity.

8. A system as claimed in Claim 7, wherein the routing entity is arranged to control routing of virtual circuits so as to cause the proportion of the data to be communicated over the communications link of the number of the plurality of the communications links.

9. A system as claimed in Claim 6, further comprising a controller unit, the controller unit comprising the routing entity.

10. A system as claimed in Claim 7, wherein the routing entity is arranged to edit headers of data units to contain an address corresponding to the communications link of the number of the plurality of the communications links.

11. A system as claimed in Claim 9, wherein the routing entity is arranged to edit headers of data units to contain an address corresponding to the communications link of the number of the plurality of the communications links.

12. A system as claimed in Claim 6, wherein the routing entity is arranged to edit path identifiers of data units so that the proportion of the data is communicated over the communications link of the number of the plurality of communications links.

13. A system as claimed in Claim 1, further comprising a controller unit, the controller unit being arranged to select the number of the plurality of communications links from the plurality of communications links in response to respective signal quality criteria of the plurality of communications links.

14. A system as claimed in Claim 13, wherein the controller is arranged to select the number of the plurality of communications links from the plurality of

communications links in response to respective bandwidth availability of the plurality of communications links.

15. A communications terminal comprising a plurality of modems coupled to an antenna arrangement, the antenna arrangement supporting a plurality of simultaneous communications links, a number of the plurality of simultaneous communications links bearing content data, wherein the content data born by each of the number of the plurality of simultaneous communications links are non-identical.

16. A terminal as claimed in Claim 15, wherein the terminal comprises a sectored multiple beam antenna arranged to direct an antenna beam to one of the plurality of base stations for providing a near-isolated communications link to the one of the plurality of base stations.

17. A method of communicating data between a plurality of base stations and a terminal, the method comprising the step of:
establishing a plurality of respective simultaneous communications links between the plurality of base stations and the terminal, a number of the plurality of simultaneous communications links bearing content data, wherein the content data born by each of the number of the plurality of simultaneous communications links are non-identical.

18. A method as claimed in Claim 17, wherein the terminal comprises an antenna arrangement, and the method further comprises the step of:
directing a sector or a beam to one of the plurality of base stations for providing a near-isolated communications link to the one of the plurality of base stations.

19. A method as claimed in Claim 17, further comprising the step of:
communicating the content data via the number of the plurality of communications links, a proportion of the data being communicated over a communications link of the number of the plurality of communications links and another proportion of the data

being simultaneously communicated over another communications link of the number of the plurality of communications links.

20. A method as claimed in Claim 19, wherein a source of the content data controls routing of virtual circuits so as to cause the proportion of the content data to be communicated over the communications link of the number of the plurality of the communications links.

21. A method as claimed in Claim 19, further comprising the step of:

editing headers of data units to contain an address corresponding to the communications link of the number of the plurality of the communications links.

22. A method as claimed in Claim 19, further comprising the step of:

editing path identifiers of data units so that the proportion of the data is communicated over the communications link of the number of the plurality of communications links.

23. A method as claimed in Claim 17, further comprising the step of:

selecting the number of the plurality of communications links from the plurality of communications links in response to respective signal quality criteria of the plurality of communications links.

24. A method as claimed in Claim 23, further comprising the step of:

selecting the number of the plurality of communications links from the plurality of communications links in response to respective bandwidth availability of the plurality of communications links.

25. Computer executable software code stored on a computer readable medium, the code being for communicating data between a plurality of base stations and a terminal, the code comprising:

code to establish a plurality of simultaneous communications links between the plurality of base stations and the terminal, a number of the plurality of simultaneous communications links bearing content data, wherein the content data born by each of the number of the plurality of simultaneous communications links is non-identical.

26. Computer executable software code as claimed in Claim 25, wherein the terminal comprises a sectored multiple beam antenna, and the code further comprises:

code to direct a sector or a beam to on5 of the plurality of base stations for providing a near-isolated communications link to the one of the plurality of base stations.

27. Computer executable software code as claimed in Claim 25, further comprising:

code to communicate the content data via the number of the plurality of communications links, a proportion of the data being communicated over a communications link of the number of the plurality of communications links and another proportion of the data being simultaneously communicated over another communications link of the number of the plurality of communications links.

28. Computer executable software code as claimed in Claim 27, further comprising code to enable a source of the content data controls routing of virtual circuits so as to cause the proportion of the content data to be communicated over the communications link of the number of the plurality of the communications links.

29. Computer executable software code as claimed in Claim 27, further comprising:

code to edit headers of data units to contain an address corresponding to the communications link of the number of the plurality of the communications links.

30. Computer executable software code as claimed in Claim 27, further comprising:

code to edit path identifiers of data units so that the proportion of the data is communicated over the communications link of the number of the plurality of communications links.

31. Computer executable software code as claimed in Claim 25, further comprising:

code to select the number of the plurality of communications links from the plurality of communications links in response to respective signal quality criteria of the plurality of communications links.

32. Computer executable software code as claimed in Claim 31, further comprising:

code to select the number of the plurality of communications links from the plurality of communications links in response to respective bandwidth availability of the plurality of communications links.

33. A programmed computer for communicating data between at least one base station and a terminal, comprising memory having at least one region for storing computer executable program code, and

a processor for executing the program code stored in memory, wherein the program code includes:

code to establish a plurality of simultaneous communications links between the plurality of base stations and the terminal, a number of the plurality of simultaneous communications links bearing content data, wherein the content data born by each of the number of the plurality of simultaneous communications links is non-identical.

34. A programmed computer as claimed in Claim 33, wherein the terminal comprises a sectored multiple beam antenna, and the program code further comprises:

code to direct a sector or a beam to one of the plurality of base stations for providing a near-isolated communications link to the one of the plurality of base stations.

35. A programmed computer as claimed in Claim 33, the program code further comprising:

code to communicate the content data via the number of the plurality of communications links, a proportion of the data being communicated over a communications link of the number of the plurality of communications links and another proportion of the data being simultaneously communicated over another communications link of the number of the plurality of communications links.

36. A programmed computer as claimed in Claim 35, the program code further comprising code to enable a source of the content data controls routing of virtual circuits so as to cause the proportion of the content data to be communicated over the communications link of the number of the plurality of the communications links.

37. A programmed computer as claimed in Claim 35, the program code further comprising:

code to edit headers of data units to contain an address corresponding to the communications link of the number of the plurality of the communications links.

38. A programmed computer as claimed in Claim 35, the program code further comprising:

code to edit path identifiers of data units so that the proportion of the data is communicated over the communications link of the number of the plurality of communications links.

39. A programmed computer as claimed in Claim 33, the program code further comprising:
code to select the number of the plurality of communications links from the plurality of communications links in response to respective signal quality criteria of the plurality of communications links.

40. A programmed computer as claimed in Claim 39, the program code further comprising:

code to select the number of the plurality of communications links from the plurality of communications links in response to respective bandwidth availability of the plurality of communications links.

41. A computer readable medium having computer executable software code stored thereon, the code being for communicating data between at least one base station and a terminal and comprising:
code to establish a plurality of simultaneous communications links between the plurality of base stations and the terminal, a number of the plurality of simultaneous communications links bearing content data, wherein the content data born by each of the number of the plurality of simultaneous communications links is non-identical.

42. A computer readable medium as claimed in Claim 41, wherein the terminal comprises a sectored multiple beam antenna, and the program code further comprises:
code to direct a sector or a beam to one of the plurality of base stations for providing a near-isolated communications link to the one of the plurality of base stations.

43. A computer readable medium as claimed in Claim 41, the program code further comprising:
code to communicate the content data via the number of the plurality of communications links, a proportion of the data being communicated over a

communications link of the number of the plurality of communications links and another proportion of the data being simultaneously communicated over another communications link of the number of the plurality of communications links.

44. A computer readable medium as claimed in Claim 43, the program code furt5e6 Computer Program code to enable a source of the content data controls routing of virtual circuits so as to cause the proportion of the content data to be communicated over the communications link of the number of the plurality of the communications links.

45. A computer readable medium as claimed in Claim 43, the program code further comprising:

code to edit headers of data units to contain an address corresponding to the communications link of the number of the plurality of the communications links.

46. A computer readable medium as claimed in Claim 43, the program code further comprising:

code to edit path identifiers of data units so that the proportion of the data is communicated over the communications link of the number of the plurality of communications links.

47. A computer readable medium as claimed in Claim 41, the program code further comprising:

code to select the number of the plurality of communications links from the plurality of communications links in response to respective signal quality criteria of the plurality of communications links.

48. A computer readable medium as claimed in Claim 47, the program code further comprising:

code to select the number of the plurality of communications links from the plurality of communications links in response to respective bandwidth availability of the plurality of communications links.